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Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

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Thomson Licensing S.A.
46, Quai Alphonse Le Gallo
92100 Boulogne
FRANCE

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System and process for selecting an item in a list of items and associated products

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System and process for selecting an item in a list of items and associated products

The present invention relates to a system and a process for selecting an item in a list of items. It also concerns notably an interactive EPG assembly and possibly associated broadcast receiver and a music files retrieval assembly. The invention is also related to a remote control, well suited to such a selecting system.

Nowadays, an immense multiplicity of television programs can be received, which renders fast and convenient finding of a desired program difficult. Many users are incapable of keeping the program number of their television set belonging to a broadcast station in mind, or do not want to. Thus, fast switching to the desired broadcast station is not possible, despite generally available numeric keyboards with the numbers 0 to 9.

Moreover, depending upon the principle used, for the input of two or more digit program numbers either the digit sequence has to be entered within a determined period of time, or the number of digits to be entered has to be selected before entering the program number. In the first case, if the user does not enter the desired program number fast enough, switching to an undesired broadcast station may take place during the input of the program number, whereas in the latter case operating additional keys is necessary. If the user were mistaken about the actual program number, either the input must be completed, or he has to select the number of digit positions again and proceed anew in the known manner.

In newer television receivers, a list of station names is frequently indicated, from which the user can select a desired station by means of cursor keys. These station names may be generated automatically, for example from the videotext information, or be manually entered. However, dependent on the screen size and resolution, not all station names may be

displayed at one time. Often also, it is not desired to completely cover the entire screen with the list, so that the current program can be further watched until switchover is achieved. In such a case, visible contents of the list must be repeatedly changed, in order to display further station names. The associated necessary interaction of the user can then substantially limit the control comfort.

The sequential switching of the programs by means of selection keys, which in each case select the next higher or next lower program number, is suitable for fast switching through the programs. However, the program sequence is fixed by the programming of the stations in the television receiver. It is thus not possible to avoid selecting a program within the sequence, i.e., to skip this program.

Document EP-A2-1124372 discloses an apparatus able to dynamically adjust the scroll rate used to scroll through the program information for various television programs available to a television viewer. In one embodiment, the electronic program listing is non-interactive, and program information is scrolled across the television screen. In another embodiment, the listing is interactive and the user can select a currently highlighted program. The scrolling operations are then substantially controlled by the user.

Those techniques bring user-friendly improvements for selecting a wished program. However, in the first embodiment, the user must carefully follow the scrolling of the program data, not to miss the wished information, and he must then enter the corresponding number. On the other hand, in the second embodiment, he must actively participate in the finding of the wished program, by paying sustained attention during the whole process that may have a relatively long duration.

The present invention concerns a system for convenient selection of a station from a multiplicity of stations, which may allow tuning to a desired station through a minimum effort of key actuations and in a relatively short time.

More generally, the invention pertains to a system for selecting an item in a list of items, which may be able to offer to the users user-friendly selection, through relatively fast access to wished items to be selected, through a low number of operations.

The invention also concerns a process for selecting an item in a list of items and a computer program, having similar advantages. The invention further relates to an interactive electronic program guide (EPG) assembly, a broadcast receiver and a music file retrieval assembly, comprising the selecting system of the invention. It also applies to a remote control, comprising means for remotely controlling the selecting system of the invention.

The invention applies to the fields of EPG, whether for television or radio, and to music files selection, but also notably to computer-aided writing.

To this end, the invention relates to a system for selecting an item in a list of items. That system comprises:

- providing means for repeatedly providing a dynamic display sub-list of ordered items of the list of items for displaying on a screen,
- display controlling means for controlling an orderly displaying on the screen of the items of that sub-list, side by side on the screen in a scrolling zone,
- scrolling means for scrolling at least partly the list of items on the screen, by repeatedly modifying the items of that dynamic sub-list

through canceling firstly introduced items in that sub-list and introducing new items from the list of items into that sub-list,

- and selecting means for enabling a user to select at least one of the items of that sub-list being displayed in a given selection area of the screen.

According to the invention:

- the providing means for providing that dynamic display sub-list are intended to provide simultaneously at least one additional dynamic display sub-list of items,

- the display controlling means are intended to display simultaneously on the screen the ordered items for all the sub-lists in respective different scrolling zones,

- the scrolling means are able to scroll at least partly the list in the various scrolling zones,

- and the selecting means are intended to enable a user to select the item displayed in the selection area for at least one of the sub-lists.

The invention thus relies notably on the unexpected use of two or more scrolling zones for the considered list of items, instead of one as usual. It may be based in particular on the fact that the human eye can recognize scrolling texts on a screen, even if two or more lines are displayed one above the other. This may be applied with two scrolling texts having different individual speeds. A similar method is used for example with stock exchange information systems that show two lines of scrolling text at different speeds with market price information at the lower edge of a screen.

Also or instead, it may be used on the ground of complementary information displayed on screen in various scrolling zones, thus enabling faster and more convenient search of data. Indeed, the user may then

concentrate his attention on one or the other of the sub-lists, in function of the relevant displayed contents of the list with respect to his expectations.

The selecting system of the invention thus offers a potentially very efficient tool for selecting items in lists, with a possibly reduced number of operations thanks to the combined exploitation of the dynamic sub-lists.

The selection area may cover one or several items in each of the sub-lists. It should be considered as a "virtual" area, which may be constituted of several disconnected parts, and which could be totally or partially visible to the user. In case several items are to be selected together in the selection area, a further selection mechanism is required.

Preferably:

- the selecting system also comprises activation means for activating at least one of the sub-lists and for de-activating any other of the sub-lists, only that activated sub-list being able to be used for selecting one of the displayed items,
- and the selecting means are intended to select the item displayed in the selection area only for the activated sub-list.

In this way, the user can select both the relevant sub-list and the wished items therein. In practice, the selection area may then apply to all the sub-lists, but only the part corresponding to the activated one is used to select the relevant item(s). In an advantageous form of that embodiment, the activation means are intended to activate only one of the sub-lists and the selecting means are intended to select only one of its items, which appears in the part of the selection area corresponding to the activated sub-list.

Also, the scrolling means are preferably designed to use at least one lower speed for the activated sub-list(s) and at least one faster speed for

the de-activated sub-list(s). The user is then able to have at the same time a higher speed for fast moving across the list, and a lower speed for precise selection in the relevant passages of the list.

In another embodiment, the selecting means are intended to provide in one single user operation a selection of several items, which appear at the same time in the selection area. Then, either the user is provided to exploit all selected items, or a further selection mechanism is used.

In a first form of such a complementary selection, the scrolling means are intended to scroll the selected items on the screen, and the selecting means are intended to enable the user to select one of the pre-selected items in a smaller auxiliary selection area. In a second form, the selecting means are intended to select explicitly the right item in function of a specific instruction given by the user for identifying the targeted item, for example by pressing a key with a number on a remote control corresponding to a given position in the selection area. In a third form, the selecting means are intended to select the right item according to the duration of a key pressing by the user. For example, the user selects first a given group of items in the list, which are displayed in the selection area, by pressing on a selection key on a remote control. That group includes items in the different sub-lists. Afterwards, the various items are successively underscored while the user maintains his pressure on the selection key. Then, when the wished item is underscored, the user stops his pressing on the selection key and that item is selected.

Any of those forms may be combined with the embodiment above involving the activating means. Namely, the activating means together with the selecting means first provide a pre-selection step, followed by a complementary selection step.

Preferably, the scrolling means are intended to automatically scroll the list at different speeds depending on the dynamic sub-lists. It is then possible to have different weights given to different kinds of data in the list, the most relevant data being associated to the lowest speed. Preferably, the user is able to decide dynamically which sub-list is activated for selection and is thus allotted the lowest speed, so that he can find and select the wanted item more quietly and safely. In another form, one of the sub-lists corresponds to a high-speed scrolling of the list for getting one's bearings, and another of the sub-lists corresponds to low-speed of the same list for later selection in the selection area.

Any combination of the achievements mentioned above is possible. For example, one sub-list associated with high-speed scrolling corresponds to a thematic presentation of the items of the list, while another sub-list associated with low-speed scrolling corresponds to an alphanumerical presentation of the same items of the list. The user being able to activate one or the other of the sub-lists depending on the current data displayed on screen for both lists, he may either select a single item in the selecting area for the alphanumerical sub-list (low speed), or a group of items in the selected area for the thematic sub-list (high speed). In the latter case, a further selection step enables him to specify the wanted item.

Advantageously, the selecting system comprises means for reversing the scrolling direction of the list for the sub-lists. Then, when a wished item is missed, it is still possible to retrieve it. Also, time may be won when the targeted items are not so remote in the scrolling direction contrary to the current one.

Preferably, the display controlling means are intended to use neighboring parallel scrolling bars as the scrolling zones. This embodiment

is simple and efficient for fast reading. However, other presentation may be used, for example spiral chains for having simultaneously large amount of data on screen.

According to an advantageous embodiment, the providing means are able to use the same items of the list for all the dynamic sub-lists. Then, notably, the dynamic sub-lists may use not only the same items, but also in the same scrolling order. Anyway, the selection may be made sensibly easier by means of different scrolling speeds, as explained above, or by having available on the screen at the same time different portions of the list. Preferably, in the latter case, the providing means are intended to provide for the various sub-lists, items as remote as possible in the list. For example, with identical scrolling speeds for all sub-lists, the new items respectively provided for the sub-lists are separated one from the other by the total number of items of the list divided by the number of sub-lists (to within one unit).

Otherwise, the dynamic sub-lists may use the same items but in a different order, or in opposite scrolling directions.

According to another embodiment, the providing means are able to use complementary items of the list for the respective dynamic sub-lists. The term "complementary" here refers to the presence of at least one item that is present in at least one of the lists and not in the others. In a special form of that embodiment, one of the sub-lists receives items that constitute extracts from another of the sub-lists. The various sub-list contents may then be "nested" one with respect to the other. This enables to give more weight to some chosen items within the whole list. In another form, the items are completely different in each of the sub-lists (no common item). Advantageously, however, the providing means are such that any two of the sub-lists share at least one of the items of the list.

Advantageously, the providing means are able to provide the items in at least one of the sub-lists with various frequencies of occurrences in function of the items. Such a solution enables to prioritize some items with respect to the others, but within a given sub-list (instead of using several sub-lists for giving different weights to different items, as mentioned above).

All those embodiments may be combined in any way, and the selecting system may be provided with the capacity to apply several of them according to different options.

Advantageously, the selecting system comprises representation means for giving to a user a further representation corresponding to the content of at least one item currently displayed in the selection area. This may make the selecting system more user-friendly and easier to exploit.

According to an advantageous embodiment, the list of items being a first level list of first level items, the selecting system is intended for first selecting one of those first level items in that first list, and for afterwards selecting at least one second level item in at least one second level list of items likewise. The selecting system further comprising means for specifying the second level list in function of the selected first level item. That embodiment leads to a "zoom-in" on the wished information. It is particularly useful when data involve several complex parameters, for example music pieces (associated with composers, interpreters, styles, etc.) or movies (associated with directors, actors, release dates, etc.) in databases.

The invention also applies to an interactive electronic program guide assembly (EPG assembly), characterized in that it comprises a selecting system in compliance with any embodiment of the invention. That selecting system is preferably intended for selecting at least one of a station

name and a program title in respectively a list of station names and a list of program titles.

The invention further relates to a broadcast receiver, preferably chosen among an interactive set-top box and an interactive television, characterized in that it comprises an interactive EPG assembly in compliance with the invention. The EPG assembly may notably be implemented in a satellite receiver.

The invention also concerns a music files retrieval assembly, characterized in that it comprises a selecting system in compliance with any of the embodiments of the invention. That selecting system is preferably intended for selecting at least one of a name of interpreter, an album and a title in respectively lists of interpreters, albums and titles. The music file retrieval assembly may be implemented notably in an MP3-player.

The invention is further related to a remote control, characterized in that it comprises remote control means for remotely controlling a selecting system in compliance with any of the embodiments of the invention. Those remote control means include a selection key enabling a user with that single key to trigger the providing means, the display controlling means and the scrolling means of the selecting system together, and to select the item(s) displayed in the selection area of the screen by triggering the selecting means of the selecting system. Thus, a very limited number of keys on the remote control may be sufficient for controlling the selecting system.

Advantageously, the selection key is also designed to enable a user to further select at least one of the entities consisting of the dynamic sub-lists and of the items previously selected in the selection area. Thus, the number of required keys is still reduced, and could be theoretically even limited to one single key.

The invention also relates to a process for selecting an item in a list of items. That process comprises the following automatic steps:

- repeatedly providing a dynamic display sub-list of ordered items of the list of items for displaying on a screen,
- controlling an orderly displaying on the screen of the items of that sub-list, side by side on the screen in a scrolling zone,
- and scrolling at least partly the list of items on the screen, by repeatedly modifying the items of that dynamic sub-list through canceling firstly introduced items in that sub-list and introducing new items from the list of items into that sub-list,

that process enabling a user to select at least one of the items of that sub-list being displayed in a given selection area of the screen.

According to the invention:

- the providing step includes providing simultaneously with said dynamic display sub-list, at least one additional dynamic display sub-list of items,
- the display controlling step includes displaying simultaneously on the screen the ordered items for all those sub-lists in respectively different scrolling zones,
- and the scrolling step includes scrolling at least partly the list in the various scrolling zones,

that process enabling a user to select the item(s) displayed in the selection area for at least one of those sub-lists.

The selecting process is preferably intended to be executed by means of a selecting system in compliance with any embodiment of the invention.

An additional aspect of the invention is a computer program product comprising program code instructions for executing the steps of the selecting process of the invention when that program is executed on a computer. By "computer program product", it is meant a support for computer program, which can consist not only in a storing space containing that program, such as a diskette or a cassette, but also in a signal, such as an electrical or optical signal.

Some specific embodiments of the selecting system will now be more specifically developed. In one of them, TV station names scroll as scrolling texts through the picture, wherein the color of the scrolling text characters differs from the remaining picture content. Each of the scrolling texts may also have a color bar as a background. Preferably, the length of the station names is limited; this is however not compellingly necessary for the method to function.

If a station name passes a preset point on the screen for an activated scrolling text, the station name may be highlighted. The highlighting may take place, for example, by changing the background color, or by changing the text color, size, font, or the like. If the next station name in the sequence passes the preset point, then this latter name is highlighted, and the station name highlighted before is represented normally again. In a preferred embodiment, a new run of a scrolling text with the station names is started after a preceding run is completed. For selecting a program, the user only needs to issue a selection command applied to the activated scrolling text, when the name of the desired station is highlighted. This can be, for example, an "OK"-key. In particular, if the user did not decide yet for a program, which he would like to watch longer and the program number of which he remembers, comfortable changing of the stations is made possible.

More specially, in a preferred development of the invention, two scrolling text bars with the station names run over the screen at different

speeds and are displayed one above the other on the screen. The two scrolling texts may also have different background colors, in order to improve the legibility and distinctiveness. Preferably, highlighting is active only in one scrolling text; again preferably, this is the scrolling text having the lower speed. If the user now identifies a station name, whose program is of interest to him, on the faster passing scrolling text, he shifts the highlighting to this scrolling text. The shift can take place in a simple way by means of two keys. With scrolling texts arranged one above the other, the shift can take place for example by means of two keys, which exhibit symbols for "up" and "down". As only two scrolling texts are displayed, switching the highlighting between them may also be effected by means of only one key. This switching to and fro is also called "toggle". The scrolling text now having the highlighting is then moved at lower speed, while the other scrolling text is moved at higher speed. In a preferred embodiment, both lines of scrolling text show the same station names in a staggered manner or at different speeds.

The entire selection procedure can also be achieved by using a single key only. A first pressing of the key causes the display of the scrolling texts. A further short operation of the key switches the highlighting between the scrolling text lines. A long operation of the key selects the currently emphasized station. After the selection of a new station, the scrolling text can be faded out, or fading out takes place if no key actuation took place for a certain time. In this case, preferably, a fading out takes place only if a complete run of the station names took place in one or all of the scrolling text lines.

In a further advanced embodiment, the point on the screen, at which a station name is highlighted, can be shifted by means of further keys in or against the direction of motion of the scrolling text. This may serve notably to shorten or extend the time up to the selection of a desired station.

The further keys may be provided, for example, with signs for "left" and "right".

Alternatively, the scrolling text currently passing slowly may be switched back or advanced for one or more program names by means of the keys.

Advantageously, a key may be provided, with which the speed of one or all scrolling texts may temporarily be reduced or increased, or one or all scrolling texts are paused.

In a further advanced embodiment, the speed of the scrolling text is adjustable by the user. Further, also the colors of the scrolling texts as well as background may be adjustable by the user.

In a further embodiment, it is possible to select a single highlighting period of time, corresponding to a duration that is sufficient for text fields of bigger length being highlighted. In this way, all fields are highlighted for an equal period of time.

In certain applications, e.g., use for a station selector, the program currently selected may be omitted in the list, so that its name is not displayed.

With regard to the use of the selecting system in different cultures, the place on the screen in which the one or more scrolling texts are displayed, is advantageously selectable. Thus, for example, a scrolling text may be displayed at the lateral edges, in cultures that preferentially read from top to bottom. For cultures which read from the right to the left, it is appropriate to move the scrolling text into the picture from the left-hand side to the right, while it is displayed moving from the right-hand side to the left

for cultures which read from left to right. Generally, the user may also select whether the scrolling text is displayed at the upper or lower edge, or at the right or at the left-hand side, respectively.

In a further embodiment, the station names may be displayed in a sorted sequence in the scrolling text, for example in alphabetical order. It is also possible to select variously the sorting orders of the station names in different scrolling texts, in order to achieve, for example, a statistically shorter access time for any station.

In a further advanced development, the titles of the programs emitted by the stations at present are displayed in place of the station names. It may also be useful to represent titles by suitable short forms. Such a representation is, for example, easy to implement when using an EPG, as is already provided in the digital satellite reception technology.

In a further embodiment, the program of the station that is currently highlighted, is shown in a small screen window. The arrangement is then effected as picture-in-picture (PIP) or as picture-and-picture (PAP).

The picture of the station, the name of which is currently highlighted, may also be represented as a frame on the screen. In this case, all available programs are consecutively and repeatedly shown briefly to the user, until he makes a selection or terminates the program selection mode.

The indicated station names may also represent a sub-group of all available station names, for example only stations specified as "favorite". It is also possible to manipulate the frequency of occurrence of "favorites" in the entirety of station names in such a way that stations specified as "favorites" occur more frequently in the scrolling texts than those not

specified as such. The "favorites" may be specified either automatically or manually.

In other applications, the selecting system of the invention is used to access files in subdirectories. Accordingly, first only the directories of a same level are shown as the scrolling texts. If a directory is selected, the files in the next lower level are shown in the scrolling text, and so on. If more than two lines of text can be represented one above the other on the screen, the name of the directory selected in each case can be displayed on the top line. If for example a multiplicity of MP3 music files are stored on a data medium, first the names of the interpreters can be shown for selection, afterwards the albums and only then the titles of the individual tracks. For the easement of operation, the scrolling text on the title level may show "play all titles" as the first entry and "random play" as the second entry. However, these options may also be made as basic adjustment in other place.

In another embodiment for file access, scrolling texts associated with several selection parameters are shown at the same time on the screen. Then, in function of the first selection made by a user for a given parameter, the scrolling texts for the other parameters are adjusted. The operation may be repeated for the selection of next parameters. For example, file access is directed to movies, and the displayed scrolling texts are respectively related to the names of actors, the names of directors and the style of the movie (western, musical, action, love story...). In function of the first selection, for example one director, the contents of the other scrolling texts are adapted for next selection. Also, the scrolling text for an already selected movie may be used several times when relevant (for example, several actors could be chosen). Once enough information is given (for example both the names of the director and of one of the actors), a list of the movies could be displayed for the determining selection, through automatic scrolling on the screen.

In other applications, the selecting system of the invention is used for the input of alphanumeric data. Accordingly, in the scrolling texts, the letters of the alphabet as well as numerals and symbols are shown and selected in one of the ways described above. A weighting of the frequency of occurrence of the letters may be made depending upon the language selected, in order to shorten the input procedure.

In a favorable embodiment, letters that according to the word formation rules of a selected language cannot follow one another, may be omitted in the respective scrolling text.

Thus, complete texts can be entered using only one or two keys.

Besides, using only a small number of keys reduces the costs of equipment and increases the reliability of the overall system.

The selecting system can also be used advantageously with devices, which only have a two-line alphanumeric display. The anyway necessary display can thus be used more efficiently and conveniently in many cases, or a larger display may be replaced by a smaller, less expensive one.

The invention will be better understood and illustrated by means of the following embodiment and execution examples, in no way limitative, with reference to the appended figures on which:

- Figure 1 is a block diagram of a selecting system according to the invention, together with a user interface and a displaying screen;
- Figure 2 shows a TV set comprising the selecting system, user interface and screen of Figure 1;
- Figure 3 represents the part of the screen used for two scrolling selecting texts with station names, in the TV set of Figure 2;

- Figure 4 shows the complete screen partially shown in Figure 3, with a further picture displaying corresponding to the station name of the activated scrolling text in the selection area;

- Figure 5 shows another displaying arrangement for the scrolling texts with station names, in the TV set of Figure 2;

- Figure 6 represents a first embodiment of a remote control adapted to the TV set of Figure 2 with the selecting system;

- Figure 7 represents a second embodiment of a remote control adapted to the TV set of Figure 2 with the selecting system;

- Figure 8 represents a third embodiment of a remote control adapted to the TV set of Figure 2 with the selecting system;

- Figure 9 shows a portable music device comprising the selecting system, user interface and screen of Figure 1;

- Figure 10 shows the screen of Figure 9 with the displaying of two scrolling texts for first step selection of an artist in view of finding a piece of music;

- Figure 11 shows the screen of Figure 9 with the displaying of two scrolling texts for second step selection of an album in view of finding a piece of music;

- Figure 12 shows the screen of Figure 9 with the displaying of two scrolling texts for third step selection of a track in view of finding a piece of music;

- Figure 13 shows the screen of Figure 9 with the displaying of additional information corresponding to the selected piece of music in the steps illustrated in Figures 10 to 12.

In Figures 1, 2 and 7, the represented units are purely functional entities, which do not necessarily correspond to physical separated entities. Namely, they could be developed in the form of software, or be implemented in one or several integrated circuits.

Moreover, a generic notation liable to be completed by indexes, like for example "SZ" (for "scrolling zone"), refers to a given model object (e.g. a scrolling zone on screen), which may be specified into specific items (e.g. the scrolling zone SZ1 corresponding to a sub-list SL1 and the scrolling zone SZ1A further corresponding to the considered embodiment "A").

A system for selecting 1 an item from a list L1 of items (Figure 1) is used in cooperation with a displaying screen 2 and a user interface 3, so that a user can participate in the selection.

The selecting device 1 comprises:

- a providing unit 11 for repeatedly providing a first and a second dynamic display sub-lists of the list L1, respectively noted SL1 and SL2, for displaying on the screen 2;
- a display controlling unit 12 for controlling an orderly displaying of the items of the sub-lists SL1 and SL2 side by side on the screen 2, simultaneously in respectively two scrolling zones SZ1 and SZ2;
- a scrolling unit 13 for scrolling the list L1 on the screen 2 in the two scrolling zones SZ1 and SZ2, by repeatedly modifying the items of the sub-lists SL1 and SL2 through canceling firstly introduced items in those sub-lists and introducing new items from the list L1; the scrolling unit 13, when operated, scrolls the list L1 at different speeds in respectively the scrolling zones SZ1 and SZ2, finding speeds values in a speeds database 22;
- a selecting unit 14 for enabling a user to select at least one of the items in at least one of the sub-lists SL1 and SL2 displayed in a selection area 20 of the screen 2 crossing the scrolling zones SZ1 and SZ2; the selection of an item by a user is able to trigger a stopping of the display on screen 2 (by action on the display controlling unit 12);
- a representation unit 18 for giving to a user, further to the displaying of the sub-lists SL1 and SL2, a picture (fixed or video, in

representation area 25 on screen 2) or sound representation corresponding to the content of the item (or of one of the items) currently displayed in the selection area 20;

- a reversing unit 17 able to reverse the scrolling direction of the list L1 for both sub-lists SL1 and SL2 (taking the same respective speeds but in the opposite direction);
- and a retrieval unit 15 for retrieving the selected item(s) in an items database 21.

The selecting system 1 also comprises an activation unit 16 for activating one of the sub-lists SL1 or SL2 and for de-activating the other, so that only the activated sub-list can be used to select one of the displayed items in the selection area 20 – namely, only the crossing of the selection area 20 with either the scrolling zone SZ1 or the scrolling zone SZ2 is considered for selection. Further, the scrolling unit 13 accordingly gives a lower speed to the activated sub-list and a faster speed to the other.

The user may act on the scrolling unit 13 for accelerating or decelerating the speeds, as well as on the selecting unit 14, the activating unit 16 and the reversing unit 17, through the user interface 3.

The selecting system 1 makes possible a selecting process in several steps, involving successive selections in a plurality of lists Li, here L1, L2 and L3. Namely, it comprises also a specifying unit 19, able to specify the list to be used at a given selection step (after first selection step has been achieved) in function of the item selected in the previous step. Thus, after an item has been chosen in first level list L1, the list L2 is determined among several possible second level lists based on that item. Likewise, the list L3 is then determined among several possible third level lists based on the item selected in the second step in list L2. Finally, the wished item is extracted from last level (here third level) list L3.

Several applications of the selecting system 1 will now be presented in detail. In a first embodiment, that selecting system 1 is implemented in a TV set 6 (Figure 2), which integrates also the screen 2 and the user interface 3. The TV set 6, which is provided for receiving broadcast programs PG, also comprises a remote communication part 5 for a user to act on the user interface 3 by means of a remote control (for example through infrared technique).

When operated for watching or recording a wished station, the selecting system 1 displays on the bottom part of the screen 2 (noted 2A in the present example), two parallel and close bars defining respective lower and upper scrolling zones SZ1A and SZ2A (Figure 3). In each of the scrolling zones SZ1A and SZ2A, station names are scrolled through the screen 2A from right to left side. Further, the lower scrolling zone SZ1A is here selected as the activated zone for selection, while the upper scrolling zone SZ2A is not. Thus, the selection area 20 appears to the user as a reduced selection area 20A, restricted to the lower scrolling zone SZ1A (though the complete selection area 20 covers in fact both scrolling zones SZ1A and SZ2A). Also, the scrolling of the station names in the upper scrolling zone SZ1A is faster than in the lower scrolling zone SZ2A, and the colors of the background are not the same (lighter color for the lower scrolling zone SZ1A).

Should the user activate the upper scrolling zone SZ2A instead of the lower one SZ1A, the apparent reduced selection area 20 would move upwards to the scrolling zone SZ1A, the colors of the background would be inverted for both bars and the speeds would also be inverted (faster speed for scrolling zone SZ1A).

In a broader view of the screen 2A (Figure 4), it can be seen that a picture is inserted in the representation area 25 of the screen 2A (upper right corner). Therein, a fixed picture or a video is shown, illustrating the program currently broadcast on the channel associated with the station name in the selection area 20A.

In another displaying mode (Figure 5), the scrolling zones SZ1 and SZ2, respectively noted SZ1B and SZ2B, are shown as vertical bars at the right side of the screen 2, noted 2B. The scrolling of the station names is then effected upwards. Here, the left scrolling zone SZ1B is activated (lighter color for the background, lower speed) and bears the apparent selection area 20B.

Several remote control models can be used to control the TV set 6. In a first version (Figure 6), a remote control 31 comprises:

- infrared emitters 40,
- upper and lower buttons 41 and 42 for selecting the activated scrolling zone SZ1 or SZ2,
- left and right buttons 43 and 44 for changing the scrolling direction (short time pressure) or for slowing down / speeding up the scrolling (long time pressure) – depending on the scrolling direction,
- and a central selection key 45 for selecting the item in the selection area 20 (associated with the activated scrolling zone).

In a normal mode of an advantageous embodiment, upper and lower buttons 41 and 42 are used for volume control, and left and right buttons 43 and 44 for station zapping (or conversely). Then, an initial pressure on selection key 45 switches from the normal mode to the selection mode described above. After selection, the remote control 31 automatically switches back to the normal mode.

In a second version of the remote control (Figure 7), noted 32, the latter comprises:

- the infrared emitters 40,
- upper right button 46 having left and right pressure sides, for changing the scrolling direction (short time pressure) or for slowing down / speeding up the scrolling (long time pressure) – depending on the scrolling direction,
- middle button 47 having upper and bottom pressure sides, for selecting the activated scrolling zone SZ1 or SZ2,
- and a bottom selection key 48 for selecting the item in the selection area 20 (associated with the activated scrolling zone).

Here again, in an advantageous embodiment, the remote control 32 can be used also for the normal mode, like for the remote control 31 (similar functioning). Also, the buttons may be designed with a toggle mechanism.

A third version of the remote control, noted 33 (Figure 8), relates to a "one-button" design. Further to the infrared emitters 40, the remote control 33 indeed comprises only one key 49. It is then used in the following way:

- first pressure: the scrolling is initiated,
- short time second pressure: the activated scrolling zone is changed,
- long time second pressure: the current item (in the selection area and in the activated scrolling zone) is selected,
- short time third pressure: the activated scrolling zone is changed again,
- long time third pressure: the current item (in the selection area and in the activated scrolling zone) is selected.

After selection, the scrolling may automatically be switched off.

In a second application embodiment of the selecting system 1, the selecting system 1 is implemented in a portable music device 7 (Figure 9), which integrates also the screen 2 and the user interface 3. The music device 7 is also provided with a storing space 8 for recording the items database 21 (music contents) and data 23 on music contents.

When operated for finding a given piece of music, the selecting system 1 displays on the screen 2 (noted 2C in the present example), two parallel and close bars defining respectively lower and upper scrolling zones SZ1C and SZ2C (Figure 10). In each of the scrolling zones SZ1C and SZ2C, artists' names are scrolled through the screen 2C from right to left side. The names of the artists as a whole form a first list L1C of items, from which sub-lists are respectively displayed in the scrolling zones SZ1C and SZ2C. Further, the lower scrolling zone SZ1C is here selected as the activated zone for selection, while the upper scrolling zone SZ2C is not. Thus, the selection area 20 appears to the user as a reduced selection area 20C, restricted to the lower scrolling zone SZ1C (though the complete selection area 20 covers in fact both scrolling zones SZ1C and SZ2C). Also, the scrolling of the station names in the upper scrolling zone SZ1C is faster than in the lower scrolling zone SZ2C.

The name of the artist currently appearing in the reduced selection area 20C, noted IT1 (for item of the first list L1C) is reported in a left upper area A1. When the user validates the choice of the artist name, the latter moves upwards to a supplementary left upper area A2 (Figure 11) and remains fixed. Also, the artists' names in the scrolling zones SZ1C and SZ2C are replaced by albums names related to the selected artist, whose name is displayed in area A2. The names of those albums, as a whole, form a second list L2C of items that depends on the identity of the artist, i.e. on

the item IT1. The second list L2C is thus determined dynamically from the selection in the first list L1C. The name of the album currently appearing in the reduced selection area 20C, noted IT2 (for item of the second list L2C) is further reported in the left upper area A1.

When the user validates the choice of the album name, the latter remains fixed in the area A1. Also, the names of the albums in the scrolling zones SZ1C and SZ2C are replaced by the names of music pieces associated with tracks that can be found in the selected album (Figure 12). Those names, as a whole, form a third list L3C of items that depends on the identity of the album, i.e. on the item IT2. The third list L3C is thus determined dynamically from the selection in the second list L2C. The third list L3C also includes two particular items: ITA, for orderly playing all tracks of the selected album (IT2) and ITR, for playing them randomly.

When the item IT3 of the third list L3C is selected, that item IT3 (either the name of a piece of music or one of the special items ITA and ITR) is displayed in a left area A3 positioned at the level of the upper scrolling zone SZ2C (Figure 13). Moreover, additional information INFO on the selected piece of music, the album and/or the artist is scrolled in the lower scrolling zone SZ1C.

In an improved version, several artists may be successively chosen for determining the album (for example the composer(s), the musician(s), current singer(s), original singer(s) and so on). Then, more lists are used at first steps, the names of the selected artists being for instance displayed side by side in a bar parallel to the scrolling zones SZ1C and SZ2C. Also, a list of date ranges may be used to specify the period of the searched records. The list of albums names is thus determined in function of a set of criteria, for corresponding at the same time to the various chosen artists. A special entry is advantageously provided, for a user to stop the

selection of further data (artists and date), and to search for the appropriate list of albums from the previously selected items. Some special provisions may be implemented to inform the user that no album is available with the given data together, and to invite him to reduce the number of constraints.

5

CLAIMS

1. System for selecting (1) an item in a list (Li) of items, said system (1) comprising:

- providing means (11) for repeatedly providing a dynamic display sub-list (SL1) of ordered items of said list (Li) of items for displaying on a screen (2),
- display controlling means (12) for controlling an orderly displaying on said screen (2) of the items of said sub-list (SL1), side by side on the screen (2) in a scrolling zone (SZ1),
- scrolling means (13) for scrolling at least partly the list (Li) of items on the screen (2), by repeatedly modifying the items of said dynamic sub-list (SL1) through canceling firstly introduced items in said sub-list (SL1) and introducing new items from said list (Li) of items into said sub-list (SL1),
- and selecting means (14) for enabling a user to select at least one of the items of said sub-list (SL1) being displayed in a given selection area (20) of the screen (2),

characterized in that:

- said providing means (11) for providing said dynamic display sub-list (SL1) are intended to provide simultaneously at least one additional dynamic display sub-list (SL2) of items,
- said display controlling means (12) are intended to display simultaneously on the screen (2) the ordered items for all said sub-lists (SL1, SL2) in respective different scrolling zones (SZ1, SZ2),
- said scrolling means (13) are able to scroll at least partly said list (Li) in the various scrolling zones (SL1, SL2),
- and said selecting means (14) are intended to enable a user to select said item displayed in said selection area (20) for at least one of said sub-lists (SL1, SL2).

2. Selecting system (1) according to claim 1, characterized in that:

- said selecting system (1) also comprises activation means (16) for activating at least one of said sub-lists (SL1, SL2) and for de-activating any other of said sub-lists, only said activated sub-list being able to be used for selecting one of said displayed items,

- and said selecting means (14) are intended to select said item displayed in said selection area (20) only for said activated sub-list.

3. Selecting system (1) according to claim 2, characterized in that said scrolling means (13) are intended to use at least one lower speed for said activated sub-list and at least one faster speed for said de-activated sub-list.

4. Selecting system (1) according to any of the preceding claims, characterized in that said scrolling means (13) are intended to automatically scroll said list (Li) at different speeds depending on said dynamic sub-lists (SL1, SL2).

5. Selecting system (1) according to any of the preceding claims, characterized in that said selecting system (1) comprises means for reversing (17) the scrolling direction of said list (Li) for said sub-lists (SL1, SL2).

6. Selecting system (1) according to any of the preceding claims, characterized in that said display controlling means (12) are intended to use neighboring parallel scrolling bars as said scrolling zones (SZ1, SZ2).

7. Selecting system (1) according to any of the preceding claims, characterized in that said providing means (11) are able to use the same items of said list (Li) for all said dynamic sub-lists (SL1, SL2).

8. Selecting system (1) according to any of the preceding claims, characterized in that said providing means (11) are able to use complementary items of said list (Li) for said respective dynamic sub-lists (SL1, SL2).

9. Selecting system (1) according to any of the preceding claims, characterized in that said providing means (11) are able to provide the items in at least one of said sub-lists (SL1, SL2) with various frequencies of occurrences in function of said items.

10. Selecting system (1) according to any of the preceding claims, characterized in that said selecting system (1) comprises representation means (18) for giving to a user a further representation corresponding to the content of at least one item currently displayed in said selection area (20).

11. Selecting system (1) according to any of the preceding claims, characterized in that said list (Li) of items being a first level list (L1) of first level items, said selecting system (1) is intended for first selecting one of said first level items in said first list (L1), and for afterwards selecting at least one second level item in at least one second level list (L2) of items likewise, said selecting system further comprising means for specifying said second level list (L2) in function of said selected first level item.

12. Interactive electronic program guide assembly, characterized in that it comprises a selecting system (1) in compliance with any of claims 1 to 11, said selecting system (1) being preferably intended for selecting at least one of a station name and a program title in respectively a list of station names and a list of program titles.

13. Broadcast receiver (6), preferably chosen among an interactive set-top box and an interactive television, characterized in that it comprises an interactive electronic program guide assembly in compliance with claim 12.

14. Music files retrieval assembly (7), characterized in that it comprises a selecting system (1) in compliance with any of claims 1 to 11, said selecting system (1) being preferably intended for selecting at least one of a name of interpreter, an album and a title in respectively lists of interpreters, albums and titles.

15. Remote control (31-33), characterized in that it comprises remote control means (41-49) for remotely controlling a selecting system (1) in compliance with any of claims 1 to 11, said remote control means (41-49) including a selection key (45, 48, 49) enabling a user with said single key to trigger said providing means (11), said display controlling means (12) and said scrolling means (13) together, and to select said at least one item displayed in said selection area (20) of the screen (2) by triggering said selecting means (14).

16. Remote control (33) according to claim 15, characterized in that said selection key (49) is also designed to enable a user to further select at least one of the entities consisting of said dynamic sub-lists (SL1, SL2) and of said items previously selected in said selection area (20).

17. Process for selecting an item in a list (Li) of items, said process comprising the following automatic steps:

- repeatedly providing a dynamic display sub-list (SL1) of ordered items of said list (Li) of items for displaying on a screen (2),

- controlling an orderly displaying on said screen (2) of the items of said sub-list (SL1), side by side on the screen (2) in a scrolling zone (SZ1),

- and scrolling at least partly the list (Li) of items on the screen (2), by repeatedly modifying the items of said dynamic sub-list (SL1) through canceling firstly introduced items in said sub-list (SL1) and introducing new items from said list (Li) of items into said sub-list (SL1),

said process enabling a user to select at least one of the items of said sub-list (SL1) being displayed in a given selection area (20) of the screen (2),

characterized in that:

- said providing step includes providing simultaneously with said dynamic display sub-list (SL1), at least one additional dynamic display sub-list (SL2) of items,

- said display controlling step includes displaying simultaneously on the screen (2) the ordered items for all said sub-lists (SL1, SL2) in respectively different scrolling zones (SZ1, SZ2),

- and said scrolling step includes scrolling at least partly said list (Li) in the various scrolling zones (SL1, SL2),

said process enabling a user to select said item displayed in said selection area (20) for at least one of said sub-lists (SL1, SL2),

said process being preferably intended to be executed by means of a selecting system in compliance with any of claims 1 to 11.

18. Computer program product comprising program code instructions for executing the steps of the control process of claim 17 when said program is executed on a computer.

ABSTRACT

System and process for selecting an item in a list of items and associated products

The present invention concerns a system (1) and a process for selecting an item in a list (Li) of items and associated products.

The selecting system comprises means (11) for repeatedly and simultaneously providing at least two dynamic display sub-lists (SL1, SL2) of ordered items of the list (Li) for displaying on a screen (2), means (12) for controlling an orderly displaying of the items of each of those sub-lists side by side on the screen, simultaneously and in different scrolling zones (SZ1, SZ2) for the respective sub-lists, means (13) for scrolling at least partly the list of items on the screen in the various scrolling zones, by repeatedly modifying the items of the sub-lists through canceling firstly introduced items in the sub-lists and introducing new items from the list of items, and means (14) for enabling a user to select at least one of the items of at least one of the sub-lists being displayed in a given selection area (20).

Applications to STB and interactive TV EPG and to music files retrieval.

FIG. 1

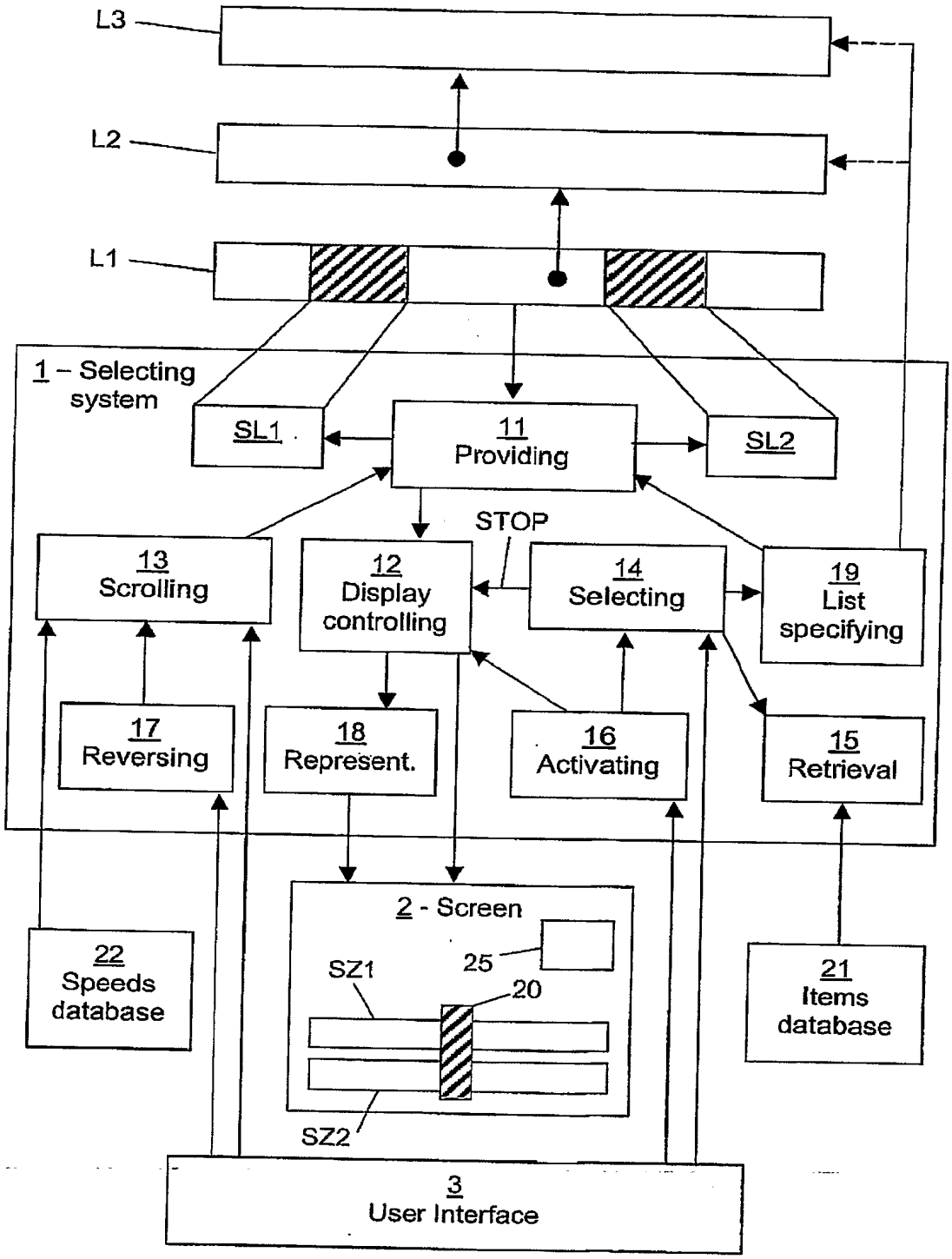
L3
L2
L1
1 – Selecting system
SL1
11 Providing
SL2
STOP
13 Scrolling
12 Display controlling
14 Selecting
19 List specifying
17 Reversing
18 Represent.
16 Activating
15 Retrieval
2 - Screen
25
SZ1
20
SZ2
22 Speeds database
21 Items database
3 User Interface

FIG. 1

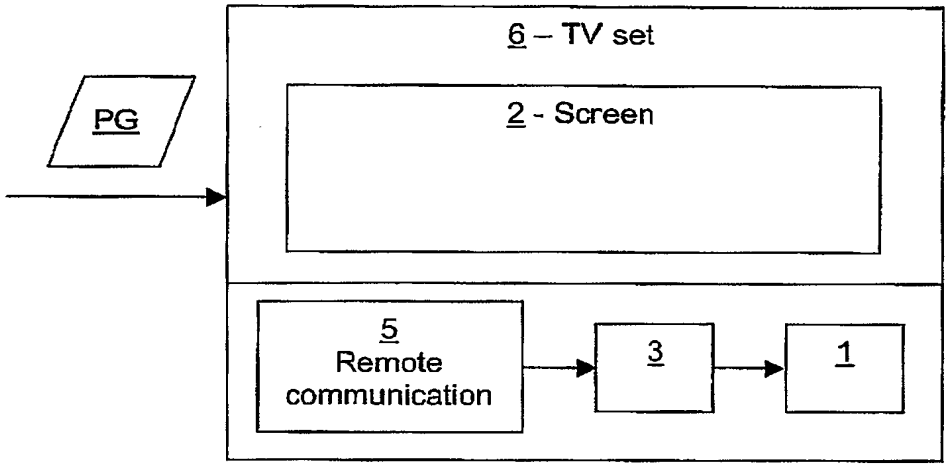
6 – TV set
PG
2 - Screen
5
Remote
communication
3
1

FIG. 2

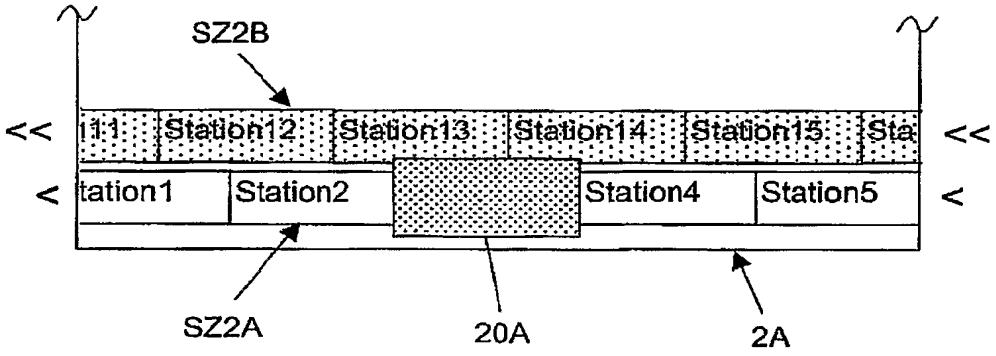
SZ2B
<<
111
Station12
Station13
Station14
Station15
Sta
<<
<
tation1
Station2
Station4
Station5
<
SZ2A
20A
2A

FIG. 3

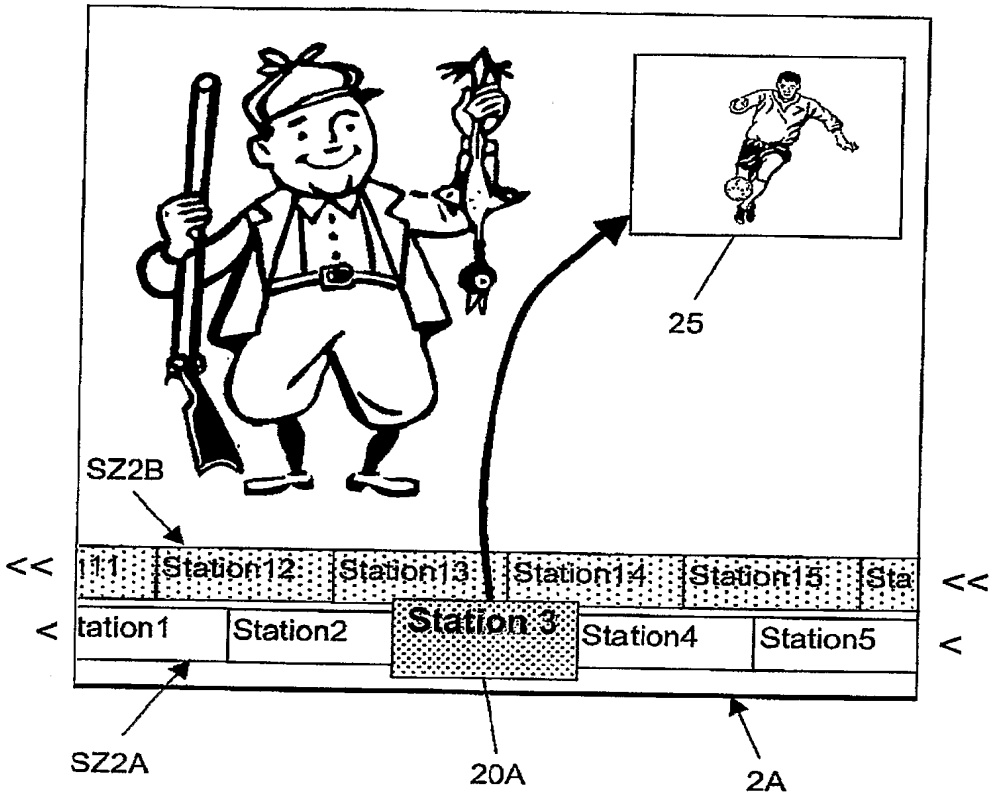
25
SZ2B
<<
111
Station12
Station13
Station14
Station15
Sta
<<
<
tation1
Station2
Station 3
Station4
Station5
<
SZ2A
20A
2A

FIG. 4

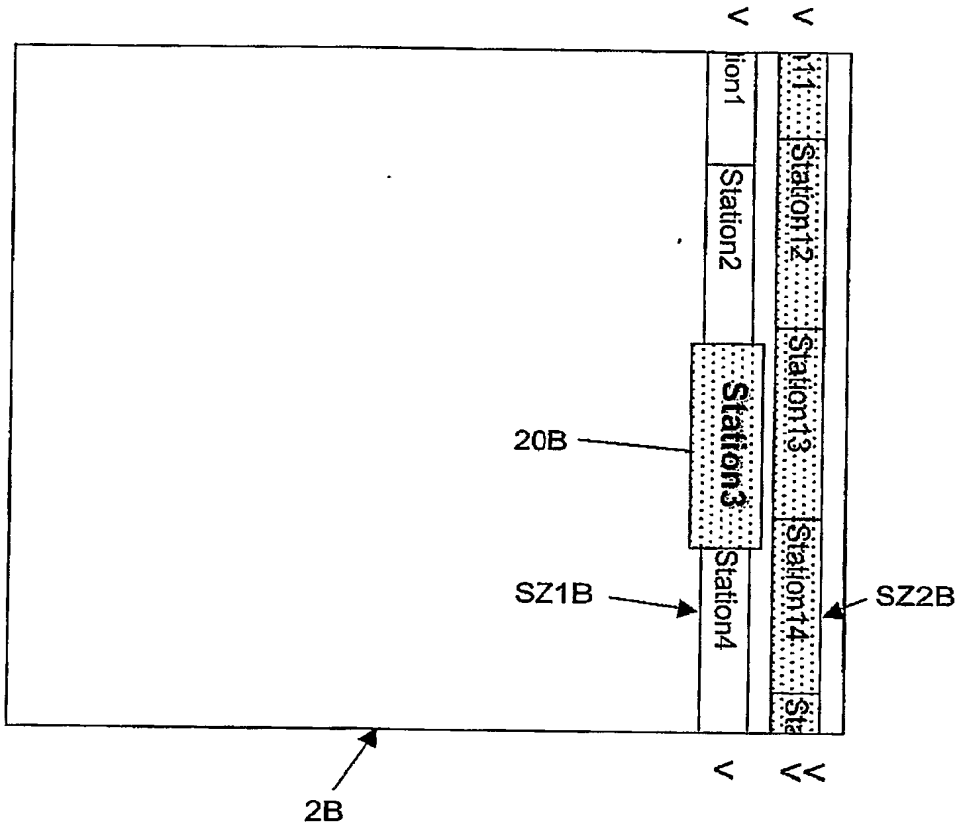
lion1
Station2
Station3
Station4
11
Station12
Station13
Station14
Sta
20B
SZ1B
SZ2B
2B

FIG. 5

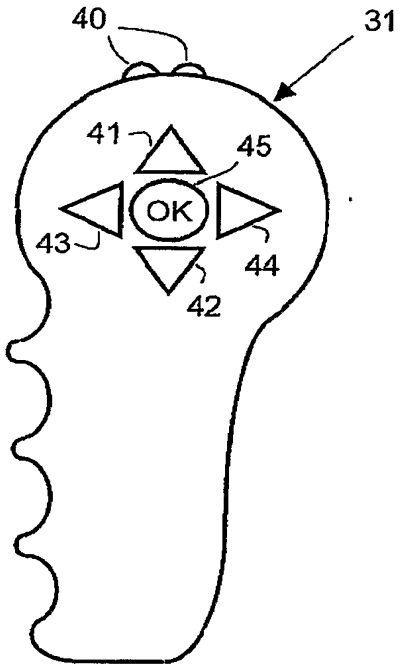

FIG. 6

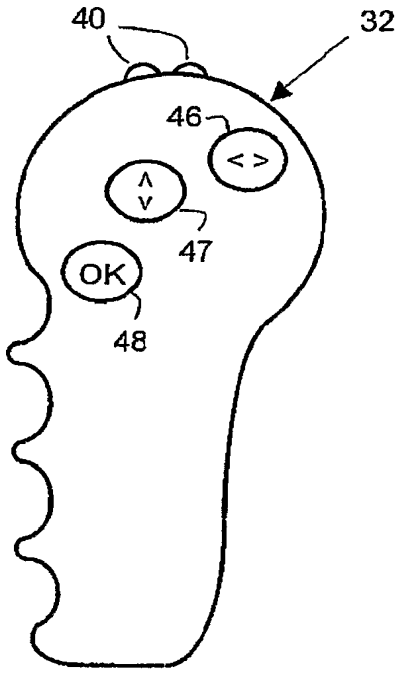

FIG. 7

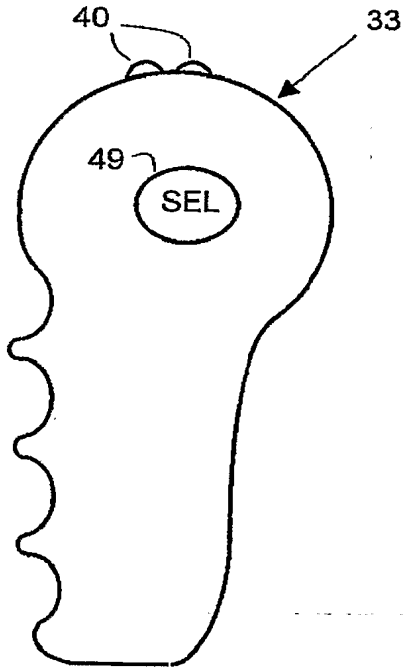

FIG. 8

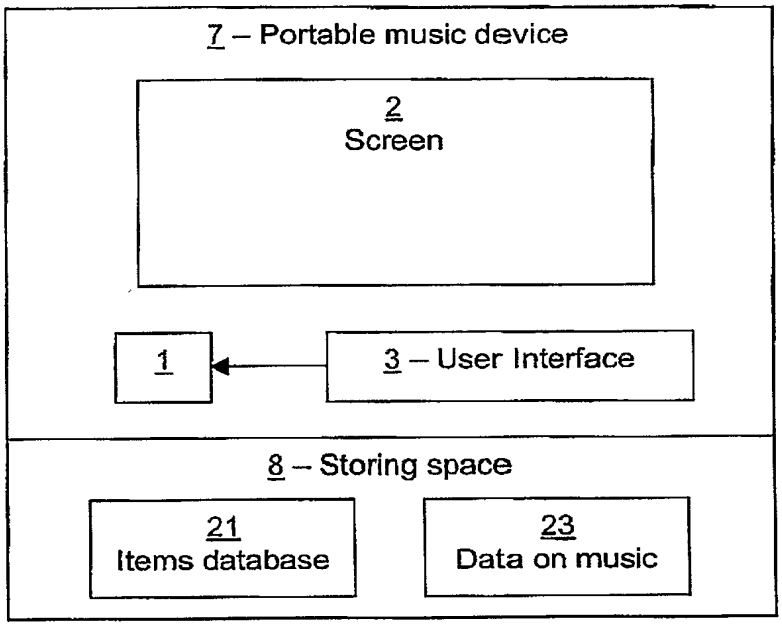
7 – Portable music device
2
Screen
1
3 – User Interface
8 – Storing space
21
Items database
23
Data on music

FIG. 9

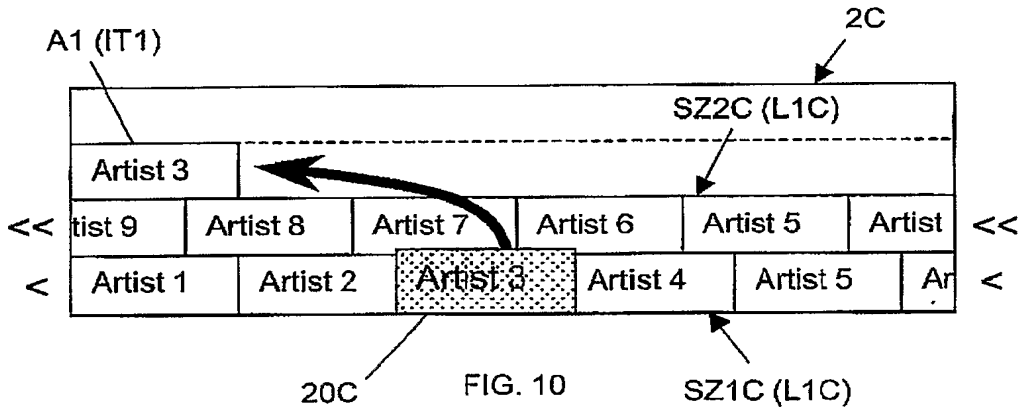
A1 (IT1)
2C
SZ2C (L1C)
Artist 3
<<
tist 9
Artist 8
Artist 7
Artist 6
Artist 5
Artist
<<
<
Artist 1
Artist 2
Artist 3
Artist 4
Artist 5
Ar
<
20C
SZ1C (L1C)

FIG. 10

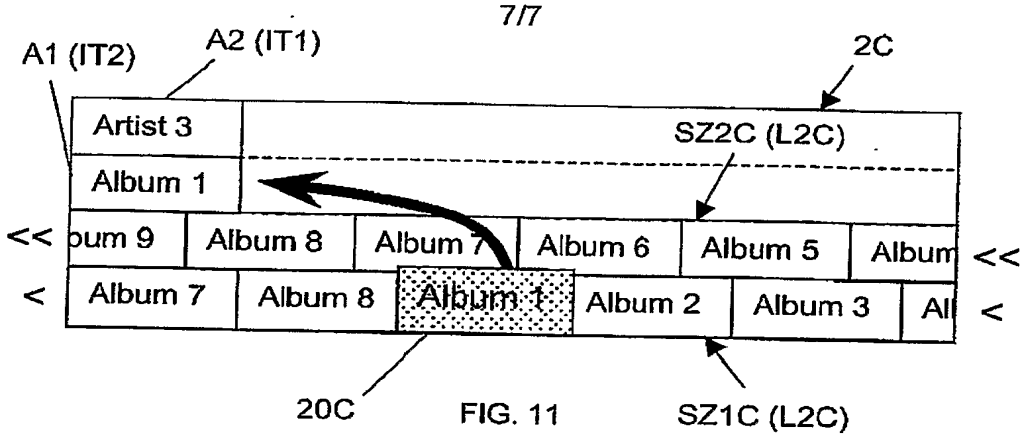

FIG. 11

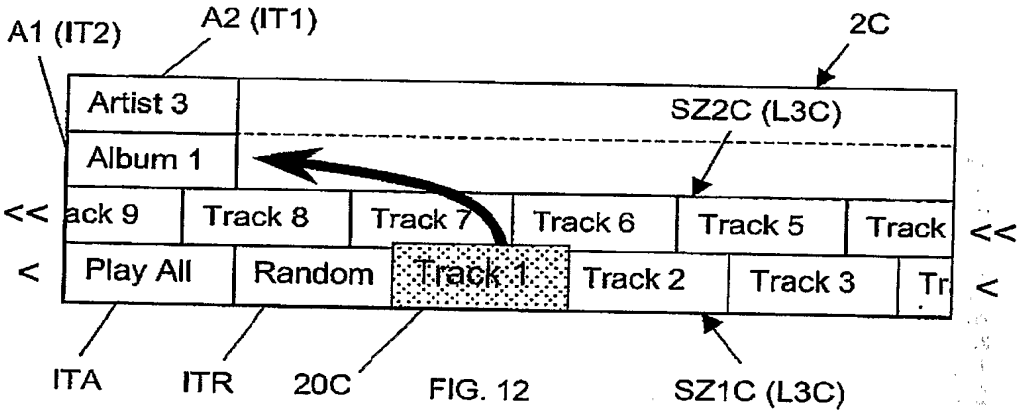

FIG. 12

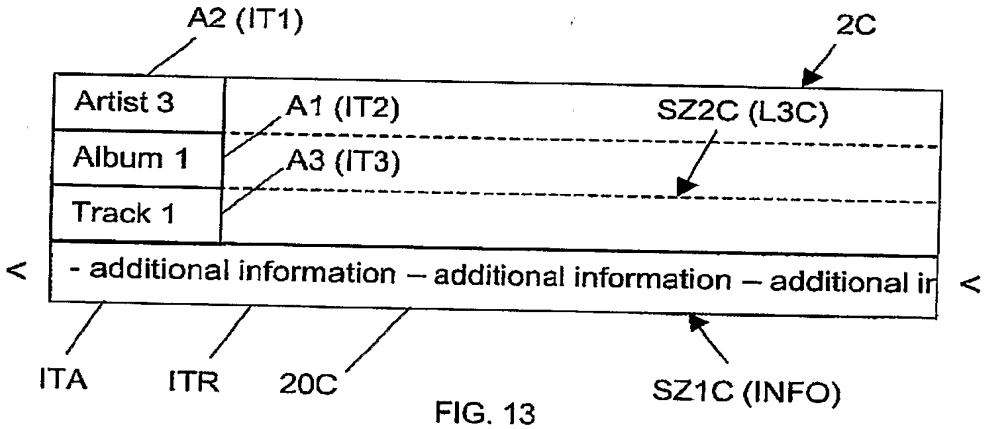

FIG. 13